



Federal Energy Management Program

Biomass and Alternative Methane Fuels (BAMF) Super ESPC Program Fact Sheet

Leading by example,
saving energy and
taxpayer dollars in
federal facilities

Biomass and Alternative Methane Fuel (BAMF) Resources

FEMP's BAMF Super ESPC can help federal agencies take advantage of abundant local, renewable resources.

Where biomass and alternative methane fuels are close enough to federal facilities to limit transportation costs, they are likely candidates for economically replacing conventional fuels in applications such as steam boilers, water heaters, engine generation sets, and gas turbines, and in many combined cooling, heating, and power systems. Using these resources can help federal facilities cut energy costs, meet goals for increasing the use of renewable energy, and reduce emissions of greenhouse gases.



Wood chips are a good source of biomass for BAMF Super ESPC projects.

An extensive biomass resource assessment identified nearly 6500 sources of renewable biomass and alternative methane fuels that are in close proximity to large federal facilities. The assessment and a data base were developed for FEMP by the National Energy Technology Laboratory (NETL) in collaboration with the Pacific Northwest National Laboratory and the U.S. Environmental Protection Agency (EPA). NETL's assessment initially focused on three resources that are expected to be major contributors to federal BAMF projects—wood waste, landfills, and wastewater treatment plants.

Biomass waste and residues, as opposed to virgin biomass, offer the most compelling energy cost savings compared to conventional fuels, because waste products often cost little or nothing, except for transportation, and may even have a negative cost if avoided landfill tipping fees are considered. Waste-to-energy projects can also prevent the destructive environmental effects that agriculture and municipal wastes can have on streams and aquifers.

Wood Waste

Huge quantities of wood residues from manufacturing, construction, demolition, and used containers that are disposed of in landfills could be used for fuel instead. Many energy applications that use coal could use wood, which produces lower emissions and less ash and contributes less to global climate change than coal. The assessment identified more than 1800 large federal facilities and nearly 4700 raw wood processors within 50 miles of each other, close enough to keep transportation costs reasonably low.

Landfill Gas

Landfills produce biogas as organic wastes decompose. This gas consists of approximately 50

What are biomass fuels?

Any organic matter available on a renewable or recurring basis (except old-growth timber) is considered biomass fuel. These fuels include dedicated energy crops and trees, agricultural food and feed-crop residues, aquatic plants, wood and wood residues, animal wastes, and other waste materials. Alternative methane fuels include landfill methane, digester gas from wastewater treatment processes, and coalbed methane.



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percent methane (the primary component of natural gas), approximately 50 percent carbon dioxide, and small amounts of nonmethane organic compounds. Instead of landfill gas being flared or allowed to escape to the atmosphere, it can be captured, converted, and used as an energy source. Capturing and using landfill gas also prevents air pollution, limits methane migration off the landfill site, and reduces emissions of greenhouse gases. Municipal solid waste in landfills can also be used as a biomass feedstock for energy applications. Using data from EPA's Landfill Methane Outreach Program, the assessment identified more than 500 landfills without active biogas projects and nearly 1200 federal facilities within 15 miles of a landfill.

Wastewater Treatment Plants

The anaerobic decomposition process that produces biogas can occur either naturally, as in a landfill, or in a controlled environment, such as a biogas plant.



Wastewater treatment yields methane from the anaerobic digestion process.

Wastewater treatment plant digester systems are airtight containers that maintain optimum conditions for quick decomposition of waste materials. Depending on the composition of feedstock and system design, digester biogas is typically 55 to 75 percent methane; state-of-the-art systems can produce biogas composed of up to 95 percent methane. Wastewater treatment plants also produce sludge that can be used as a fuel source for energy applications. Data from the EPA's database of Water Discharge Permits indicate that more than 850 large wastewater treatment plants and almost 1400 federal facilities are located within 15 miles of each other.

Coalbed and Coal Mine Methane

Coalbed methane is contained in coal seams and the surrounding geology. Unless it is drained away

from the coalbed before mining begins, the methane will be released into the mine, where it poses a serious hazard to workers as coal mine methane. Current practice is to vent the methane from the mine into the atmosphere. According to EPA, coalbed methane comprises almost 10 percent of U.S. anthropogenic methane emissions, with ventilation from mines accounting for most of those emissions.

Data from EPA's Coalbed Methane Outreach Program indicate that, of U.S. coal mines, the 400 with the highest emissions account for nearly 250 million cubic feet per day of methane. While a dozen or so of the largest underground coal mines do collect and use or sell most of their coal-mine methane, there is little effort to recover lesser though still significant volumes of methane released from smaller mines.

Is There a BAMF Opportunity in Your Backyard?

FEMP is making the energy- and cost-saving benefits of BAMF accessible to federal facilities through Super Energy Savings Performance Contracts (Super ESPCs). ESPCs enable agencies to reduce their energy costs without using Congressional appropriations for capital improvements.

To find out more about the opportunities for turning waste to energy using the BAMF Super ESPC, visit the FEMP web site at www.eere.energy.gov/femp/financing/superespcs.cfm, or contact the FEMP representative at the DOE Regional Office for your area or one of the BAMF Super ESPC Program team members:

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A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

For more information contact:
EERE Information Center
1-877-EERE-INF (1-877-337-3463)

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